SFA Modernization Partner

United States Department of Education
Student Financial Assistance

Data Warehousing Implementation Strategy
NSLDS Cost Analysis

Task Order 21
Deliverable 21.1.4

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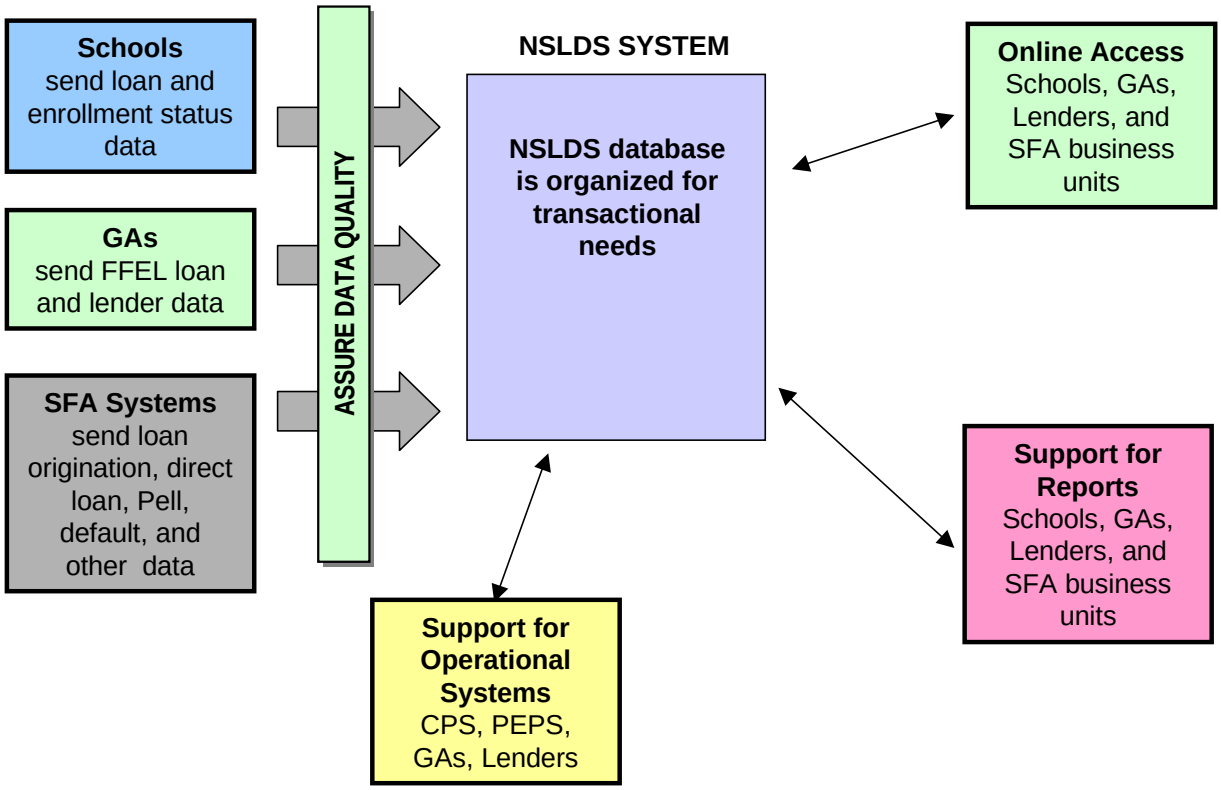
Contents

Introduction

The National Student Loan Data System (NSLDS) is a transactional system – not just a repository – that serves several important business functions, such as checking student and school eligibility. As such, the system is also not a data warehouse. NSLDS, initiated by congressional mandate, has been in production since 1994, and contains student aid data going back to 1965.

Shown below, NSLDS imports student aid data from about 2,900 schools, 36 guaranty agencies (GAs), and 5 internal SFA systems. The aid data is collected primarily to serve system-to-system business functions (described later in this document), but since the data is already being centralized, it serves users through online web access to views / reports, and through batch reports.



A high-level view of the NSLDS system

NSLDS is currently maintained by Raytheon Systems Corporation and Computer Sciences Corporation (CSC). Raytheon has an annual contract for application maintenance, and enhances the application either under the annual contract, if the effort level is below 700 hours, or through a new task order, if effort is above 700 hours.

CSC operates the Virtual Data Center aspect of NSLDS, which includes hardware, system software, the database server, and utilities. CSC also has an annual contract comprised, in large part, of expected MIPS and DASD usage.

Scope

This analysis is one of two NSLDS analyses, and presents a detailed view of the cost components as well as suggestions on what actions to take to reduce costs and increase value. We have also made suggestions on whether to fund the current enhancement requests or not.

The other analysis, due 7/31/00, will study the technical architecture and system design of NSLDS and make suggestions on how to make improvement in those areas. Ultimately, through another deliverable, we will support our recommendations through a business case.

This analysis is CIO sponsored, with the value proposition of:

- modernizing NSLDS to be a lighter, faster, and more cost-effective system
- making NSLDS's data more useful to more people.

Business Functions

NSLDS is the only system which contains a consolidated database for Title IV student aid, with aid history, and provides the following business functions:

SYSTEM-TO-SYSTEM FUNCTIONS

- **Student Eligibility** (NSLDS to CPS) - screening saves an estimated $575 million per year
- **School Eligibility** (NSLDS to PEPS) - screening filters out under-performing schools
- **Student Enrollment Tracking** (NSLDS to GAs / Schools) - maintains and communicates student enrollment status

SYSTEM-TO-USER FUNCTIONS

- **Student Aid Tracking** (NSLDS to financial aid officers, students)– maintains and communicates aid received, and contact information
- **Financial Management** (NSLDS to Financial Partners channel and CFO) - generates financial reports, supports audits and pays GAs
- **Budget forecasting and Credit Reform Act Support** (NSLDS to CFO and Policy)- preparation of ED annual budget
- **Research, Policy Analysis, and Performance Assessment** (NSLDS to SFA, OMB, GAO, OIG, and other government agencies and Congress) – makes data available to these internal and external organizations

Student Eligibility - Pre-screening and post-screening

NSLDS summarizes all previous Title IV aid a student has received into a financial aid history that is used by school Financial Aid Administrators to determine student eligibility and to configure a financial aid package for the student. NSLDS pre-screens all applicants for Title IV aid to identify applicants who are in default on an existing Title IV loan; who owe overpayments on Pell grants, FSEOGs, or Perkins loans; or who have already borrowed the maximum amount allowed under the annual, or cumulative loan limits for each loan type. NSLDS post-screens Title IV aid applicants to identify applicants whose eligibility changes after the time of their original aid application was pre-screened. This function is mandated by legislation and has a yearly estimated savings / cost avoidance of $575 million. The financial aid history is also available to authorized users on both a batch and online (real time) basis to handle mid-semester transfer students.

School Eligibility (Default Calculation)

The Schools channel is responsible for Draft and Official Cohort Default Rates which is required by legislation to be calculated semi-annually (monthly for notional default rates) for schools participating in the Federal Direct Loan Program and Federal Family Educational Loan Program. Rates are also calculated for guaranty agencies and lenders. Schools with default rates 25% or higher for at least three consecutive years (40% for 1 year) can be disqualified from participating in some or all student financial aid programs. Since the institution of the default calculation process, 1,180 schools have lost eligibility. NSLDS makes these rates (and loan detail) available on the web to Schools and selected SFA users.

Student Enrollment Tracking
Student Enrollment Tracking performs the collection and dissemination of Student Status Confirmation Report (SSCR) information. Loan holders use the SSCR to verify a borrower's enrollment status. This enrollment information permits loan holders to perform the critical steps of placing a borrower into repayment, initiating repayment grace periods, and extending in-school deferments. NSLDS has standardized the SSCR process by creating a single consolidated roster for schools to update and by sending loan holder organizations a consolidated enrollment status file of information about their borrowers. NSLDS maintains both the current and historical enrollment information for a student.

Student Aid Tracking
Student Aid Tracking has four separate sub-functions. The Student Account enables borrowers to see a consolidated view of their account and identify the current lender, servicer, or holder of each loan. Students have access to information about their financial aid at the "NSLDS Student Access" secure web site (www.nslds.ed.gov). Students can also call the Public Inquiry Contractor's (PIC) toll free number and have the PIC operators look up the information in NSLDS. The second, Borrower Tracking, helps qualified users locate borrowers who have defaulted on student loans by identifying other schools, guaranty agencies, and lenders previously associated with a borrower so they can be contacted for the borrower's current address. Loan Transfer Tracking, monitors transfer activity by maintaining dates of sale and names of loan holders. This information identifies likely problems with participants and helps evaluate the administration and billing by lenders and guaranty agencies in the FFEL loan program. Also, NSLDS tracks Organization Contacts by their job function and helps users quickly locate the correct contact person at a school, guaranty agency, lender, servicer, or other data provider. This contact capability is accessible by both online screens and through the NSLDS Information for Financial Aid Professionals web site (www.nsldsfap.gov).

Financial Management (GA Fees Calc, Financial Reports, External Audits)
NSLDS performs the calculations for the Financial Partners channel to determine fees paid to lenders and guaranty agencies. Automatic payment of Loan Processing and Account Maintenance fees from NSLDS data replaces part of the Lender and GA Billing process (form 1130/1189) which required time-consuming invoicing and verification. Financial Statements for CFO reporting to Congress and the public are also produced from NSLDS. Finally, trend analysis and other monitoring reports are produced to retrieve specific data from NSLDS on organizations (schools, lenders, and guaranty agencies) to identify key indicators used to schedule school and financial partner Audits and Program Reviews.

Budget Forecasting and Credit Reform Act Support
Every year, CFO develops input for the President's budget, based partly on projected loan program costs for a seven-year period. NSLDS information is used to develop reliable, sound forecasts and program estimates for the Department of Education Budget; answer budget related questions; and support necessary hypothetical analyses.

The Credit Reform Act (CRA) requires loan level tracking of all federally guaranteed loans. NSLDS tracks and reports loans by program, cohort year, and risk category. Loan data is used semi-annually by CFO to estimate government costs associated with loan programs.

Research, Policy Analysis and Performance Assessment

NSLDS provides several types of access in support of internal (CFO, OIG) and external (CBO, GAO) users performing Research, Policy Development and Assessment of the Performance of various Title IV aid delivery system participants and aid programs. Online queries range from focused queries, pertaining to a single student or guaranty agency for relatively small amounts of data, to queries requiring NSLDS to supply or summarize massive amounts of data.

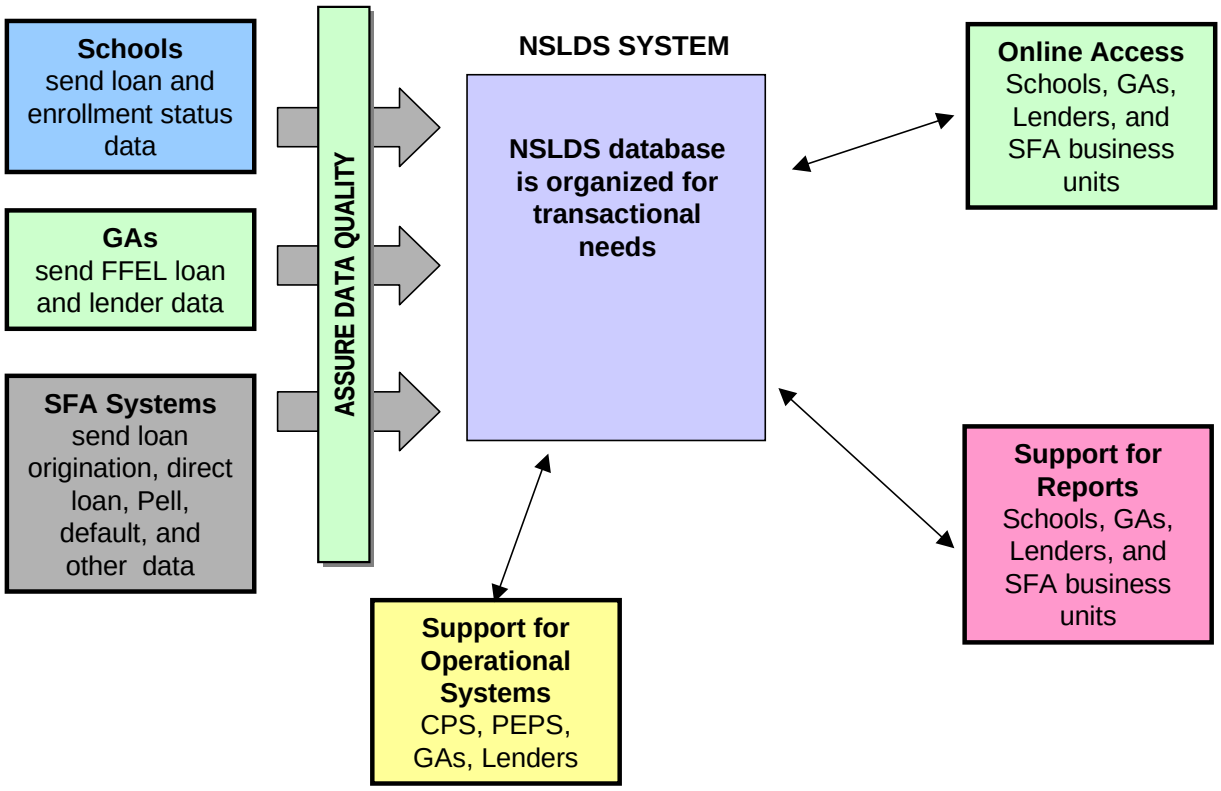
Guaranty agencies, schools, and lenders are provided reports for researching and assessing their own performance in administering the FFELP aid programs. Such research can be either short- or long-term and generally aims to evaluate the effectiveness of specific organizations and program practices.

Statistically valid random samples of the entire database are also created each quarter and loaded into a separate database called the Statistical Abstract (STAB). This smaller subset of the data is based upon 1.5 million students and consists of about 5 million records that accurately reflects the universe of 40 million students and the 135+ million loans and grants issued under the various loan programs.

NSLDS also computes monthly, quarterly, and annual Aggregates, which are pre-computed totals of the data. The aggregates are for frequently requested data where it is more efficient to compute the answer once and store it, than to add it up each time a user requests the answer. About 1,500 aggregates are computed each month.

Cost Components

NSLDS costs can be broken down into application maintenance and system maintenance. As mentioned earlier, Raytheon maintains the application, and CSC maintains the system. Below is a description of where the majority of the effort and cost is:



A high-level view of the NSLDS system

While CSC charges by estimated MIPS and DASD usage, the database, and system utilities, Raytheon charges for estimated full-time equivalents (FTEs) for the year.

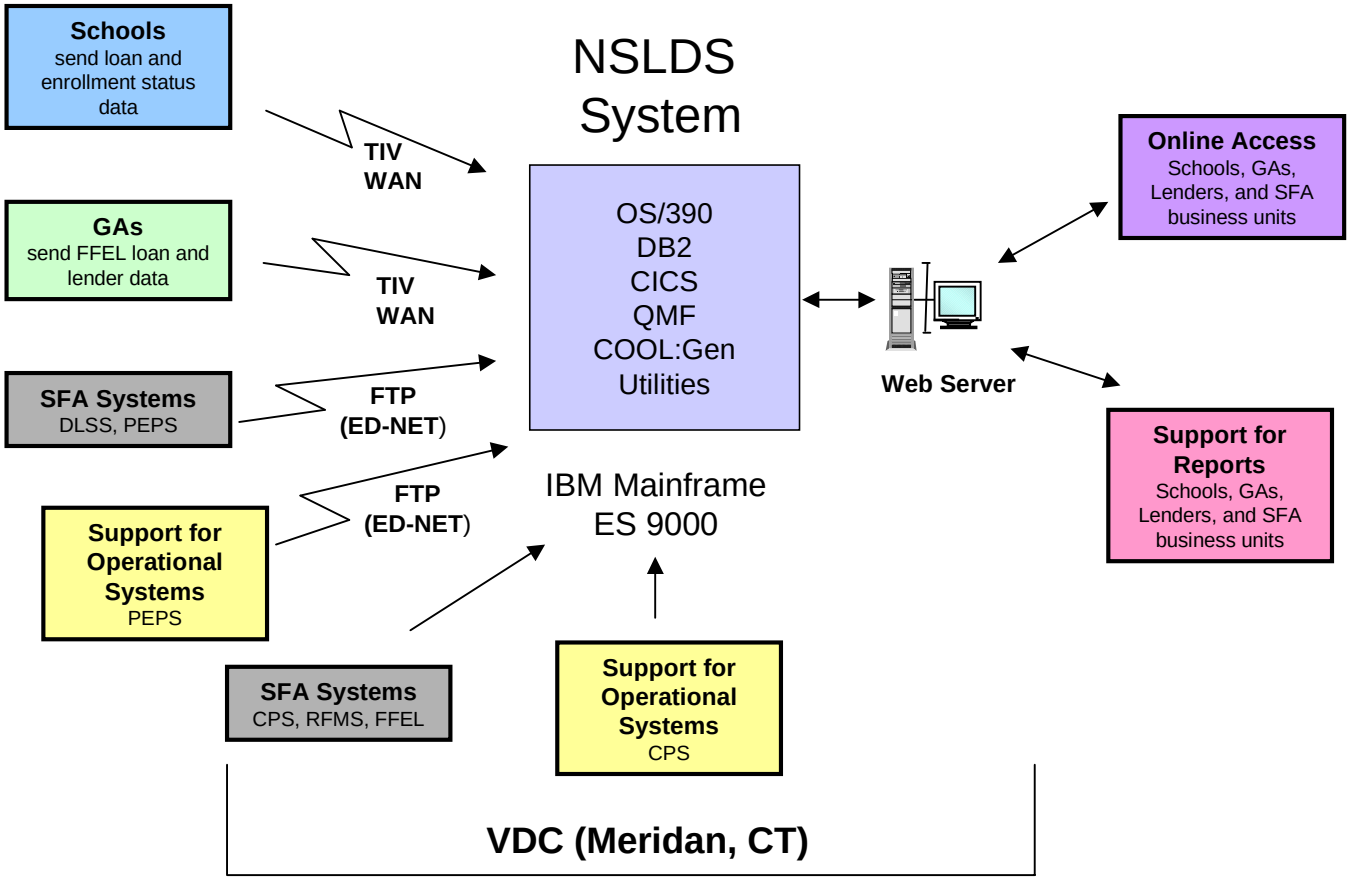
Each of the entities – schools, GAs, and SFA systems – extract their own data and format it to the standards defined by NSLDS. They then send that data to NSLDS. NSLDS runs a series of COBOL programs to assure data quality, and updates the database with the imported data. The number of programs and the effort level to maintain them is the second largest in maintaining NSLDS.

The area with the most number of COBOL programs, with the largest effort level is in the "Support for Operational Systems" box in diagram above. This is logic to serve system-to-system business functions, etc.

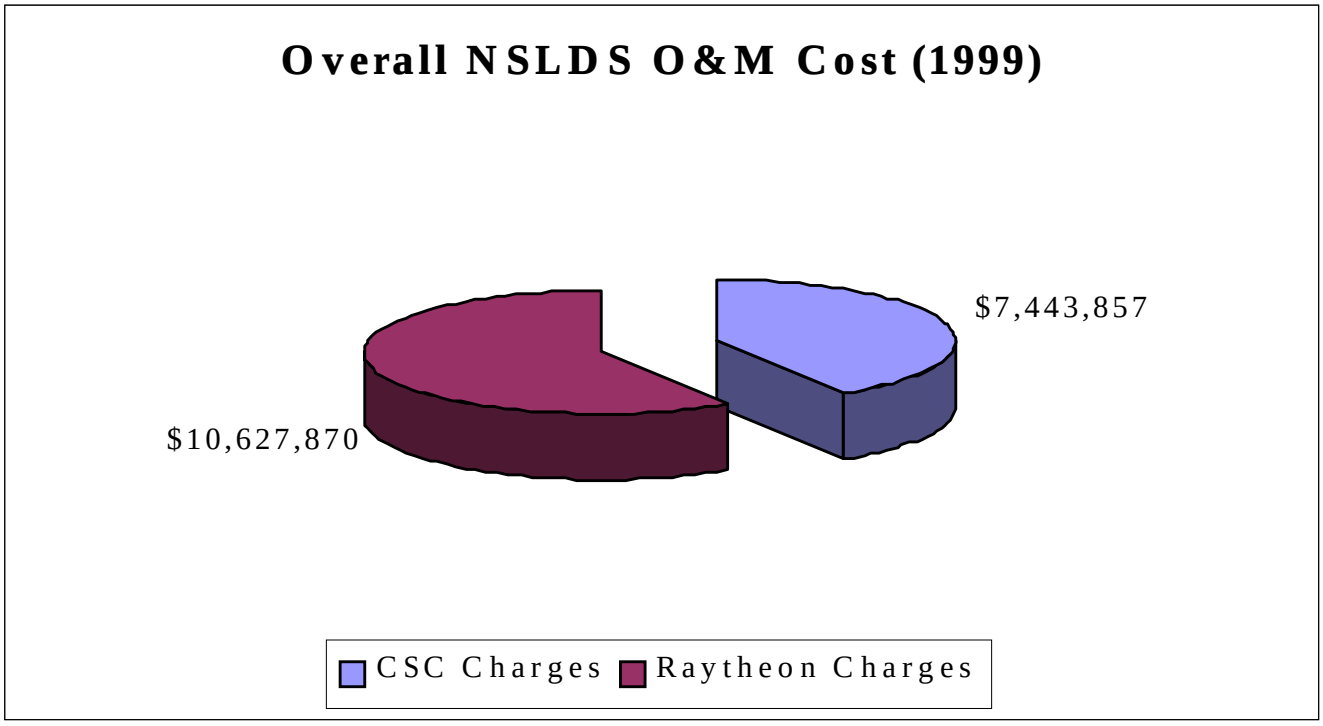
Reports and Online Access are provided through a combination of COBOL programs, QMF query tool, and a web server.

The application is enhanced and released every two weeks, on average, into production.

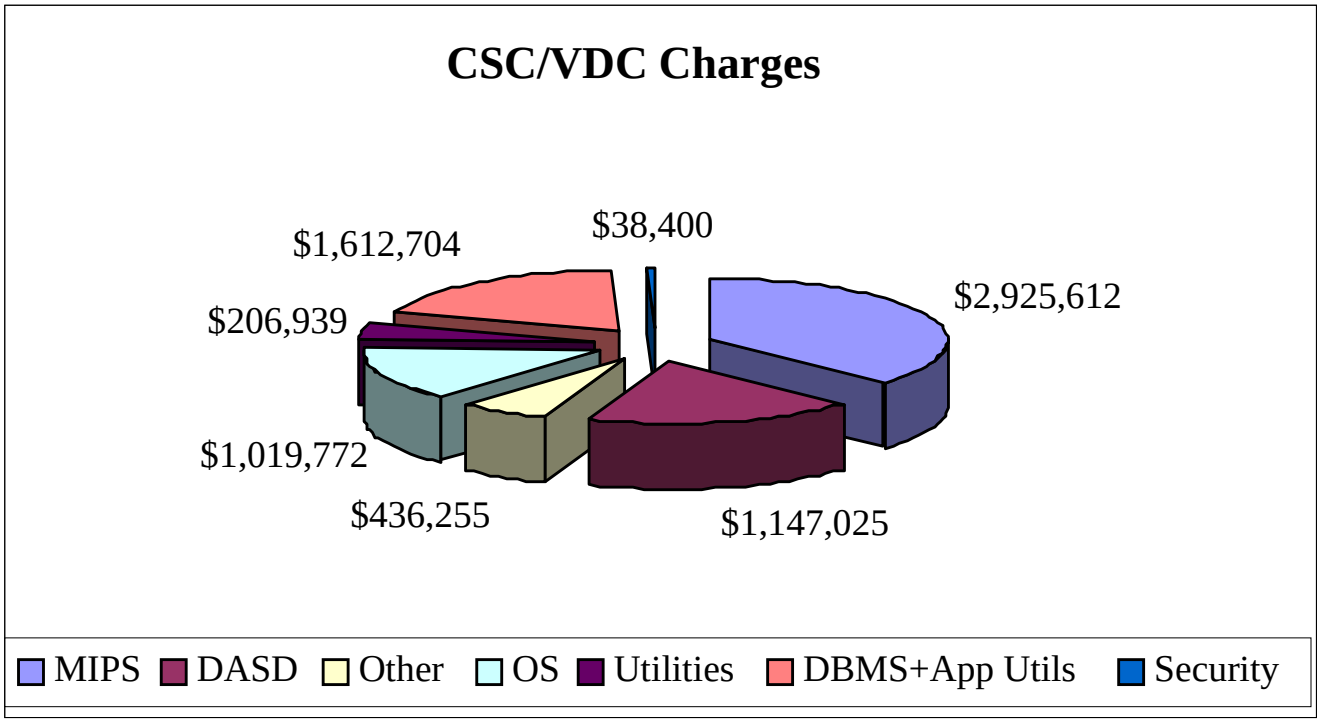
Below is a high-level view of the NSLDS technical platform.



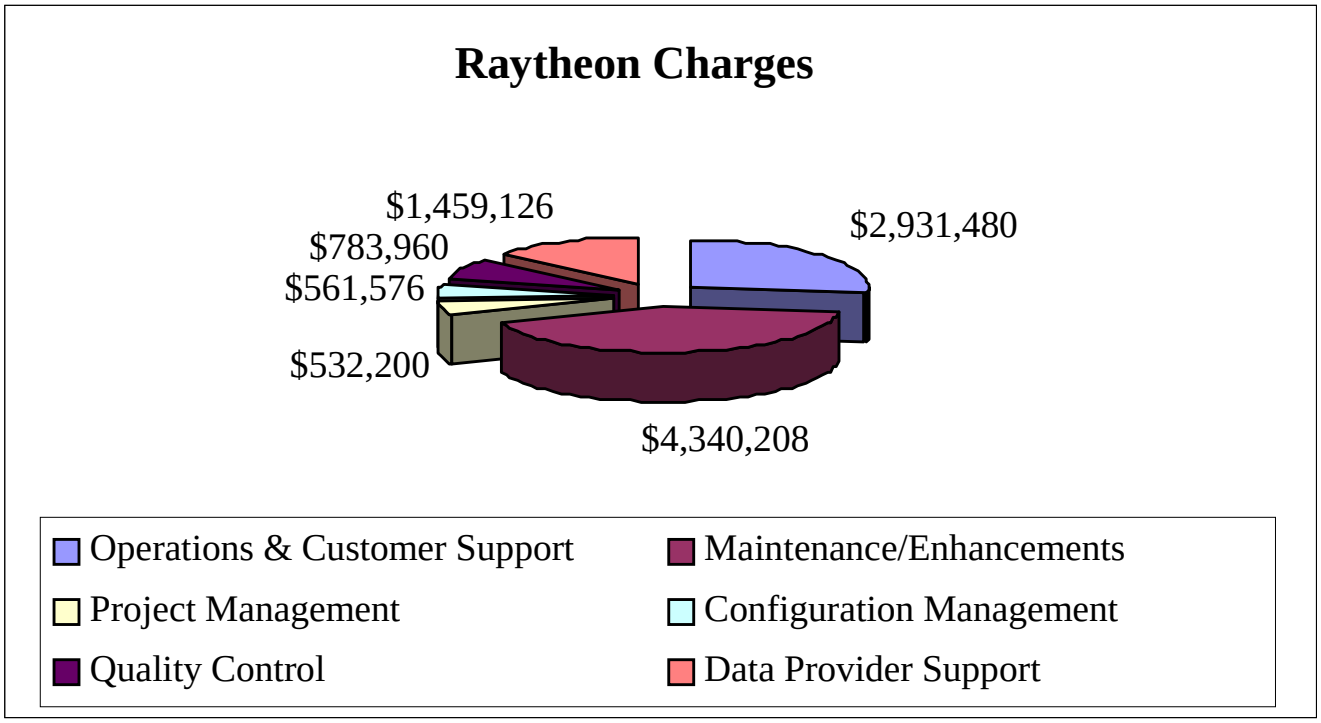
NSLDS costs the SFA over $20 million annually to operate and maintain. The numbers in the chart below are based on contractual information for 1999.



Below is a breakdown of CSC's charges for system maintenance.



The chart below shows Raytheon's application maintenance charges.



The table below shows how Raytheon is organized to deliver application maintenance.

Area	FTEs
Program Management	5
Quality Assurance	4
System Maintenance	27
Customer Support	30
Total	**66**

The table below is support data for the above charts.

	Totals	CSC		Raytheon		SFA	
		Cost	Total	Cost	Total	Cost	Total
Hardware	**$ 4,426,872**		**$ 4,407,552**		**$ 19,320**		
MIPS		$ 2,925,612					
DASD		$ 1,147,025					
Tape		$ 144,073					
Archive Storage		$ 11,910					
Print Pages		$ 178,932					
Servers/Workstations				$ 19,320			
Software	**$ 2,979,155**		**$ 2,979,155**				
IBM OS Software		**$ 1,019,772**					
OS		$ 768,000					
Spoolers		$ 30,000					
Communications SW		$ 213,372					
dev/time sharing tools		$ 6,000					
Pkgs/Access Methods		$ 2,400					
IBM Utilities		**$ 308,279**					
Perf Meas/Tuning		$ 142,292					
Resource Mgmt		$ 23,151					
Sort/Merge		$ 6,000					
Scheduling		$ 6,000					
Job Restart		$ 29,496					
Other		$ 101,340					
IBM Applications		**$ 1,612,704**					
DBMS		$ 753,960					
Compilers/Languages		$ 584,208					
DataCenter Mgmt		$ 274,536					
Security		**$ 38,400**					
VDC Common Task Order	**$ 2,000,000**					**$ 2,000,000**	**$ 2,000,000**
Services	**$ 10,665,700**		**$ 57,150**		**$ 10,608,550**		
Print/Mail tracking		$ 57,150					
CLIN25 Operations and Customer Support				$ 2,931,480			
CLIN26 Maintenance/Enhancements				$ 4,340,208			
CLIN33 Project Management				$ 532,200			
CLIN35 Configuration Management				$ 561,576			
CLIN37 Quality Control				$ 783,960			
CLIN55 Data Provider Operations Support				$ 1,459,126			
GRAND TOTAL	**$ 20,071,727**		**$ 7,443,857**		**$ 10,627,870**		**$ 2,000,000**

Cost Analysis

The CIO's office wants to modernize NSLDS to make it lighter, faster, more cost-effective and consistent with the technology direction that SFA is envisioning, while maintaining compliance with the congressional mandate. Additionally the vision is to make NSLDS's repository more valuable to many more people. The following are specific areas to consider in reducing costs related to NSLDS and increasing its value.

1. Reduce Enhancement Requests to NSLDS: In order to make NSLDS more cost-effective in the short-term, SFA should strive to reduce the number of new requirements / enhancement requests to NSLDS. By reducing the number of new requirements, there will be fewer releases, which means that fewer FTEs will be needed to maintain the system. Exceptions to this strategy would be if there are policy changes and urgent bug fixes. This can be viewed as a short-term delay in implementing some less than critical business requirements. As the NSLDS technical architecture is modified to enable individual changes without significant system-wide impact, those less critical business requirements can be scheduled.

2. Increase NSLDS' Value: NSLDS's value can be increased by making its repository easier to access and use by more people. Currently, data access, querying and reporting against NSLDS are difficult for end-users to do. Adding a user-friendly access, query and report tool will bring improved customer service and, as a secondary effect, cost savings across the organization.

3. Redesign and Re-platform NSLDS: Potential cost savings can be obtained by redesigning the technical architecture of NSLDS. We recommend logically separating NSLDS into its constituent parts of operational data and decision support data. The operational data part will be designed to be "lighter" and to serve system to system business functions. This redesigned operational part of NSLDS can be faster and cheaper to operate. Moreover, the operational part of NSLDS can be more easily migrated from the relatively more expensive mainframe platform to less expensive mid-range unix systems.

   The decision support data, unlike the operational data, should be organized for fast end-user queries and reports. In fact, the most frequently used queries and reports should be generated automatically and in advance, ready for viewing, printing, and distribution. Moreover, the decision support repository should contain historical data for performing trend analyses, forecasting, and "mining" for patterns related key metrics such as defaults, delinquencies, etc. Architecturally, decision support data can be delivered through either an enterprise data warehouse or channel-specific data marts. This layer can enable fact-based decision making and add value in terms of information delivery.

   Any plan for re-platforming or redesigning NSLDS should be founded in more knowledge of the technical architecture and rigorous testing of volumes and throughputs of both the Unix platform and ETL, database and query / access tools. Further, this type of major transformation must be carefully planned so as not to interrupt the current business functions that NSLDS serves.